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Kolloquium für Mechanik

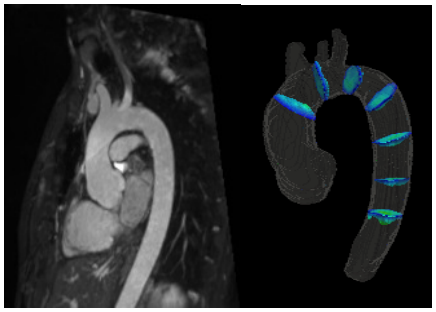
Referent: **Prof. Dr. Benyebka Bou-Saïd**
Institut National des Sciences Appliquées (INSA), Lyon, France

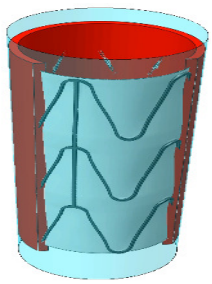
Datum: Mi., 23.11.2016
Uhrzeit: 14:00 Uhr
Ort: Seminarraum R120 des Lernzentrums (Gebäude 30.28)

Titel: **Virtual surgery for aortic aneurysms**

Abstract

The Abdominal and Thoracic Aorta Aneurysm (AAA and TAA) are cardiovascular disease that affects 6-7% of the Western population and their incidence increases with age. At least 90% of AAA and TAA come from atherosclerosis because of high cholesterol, inflammation, infection or tobacco... Most of these aneurysms are located near the bifurcation. The rupture of the aneurysm is a dangerous and fatal accident favored by arterial hypertension.
For over 50 years, open surgery was the only treatment of AAA. This is a major procedure with many risks of cardiac complications (myocardial infarction...), respiratory, bleeding, renal, infectious and colic (risk of ischemic colitis). However since 1991, a new mini-invasive surgical procedure has been introduced. This is an endovascular procedure that is to drag a stent through a release device of the femoral artery to the level of the aneurysm.
For this purpose, we have developed a numerical simulation tool to assist surgery. It contributes to the improvement of therapeutic endovascular procedures in terms of accuracy and optimizes the intervention strategy.
This tool takes into account: 1) the actual geometry bio-faithful reconstructed from preoperative clinical images on a specific group of patients with high tortuosity and calcification, 2) a local characterization of mechanical properties of the endovascular system, 3) a mapping of mechanical properties of soft tissues based on their degree of calcification (safe, calcified, thrombus), 4) hemodynamic with specific blood rheology, 5) FSI , 6) a projection of the real environment of the artery on the simulated model for each patient, 7) a pre-constraints, 8) a material and geometric non-linearity, a composite model for the wall artery ...





Alle Interessenten sind herzlich eingeladen.

Prof. Dr.-Ing. Wolfgang Seemann